Your small friend, indeed®
Health Care Logistics® INC.

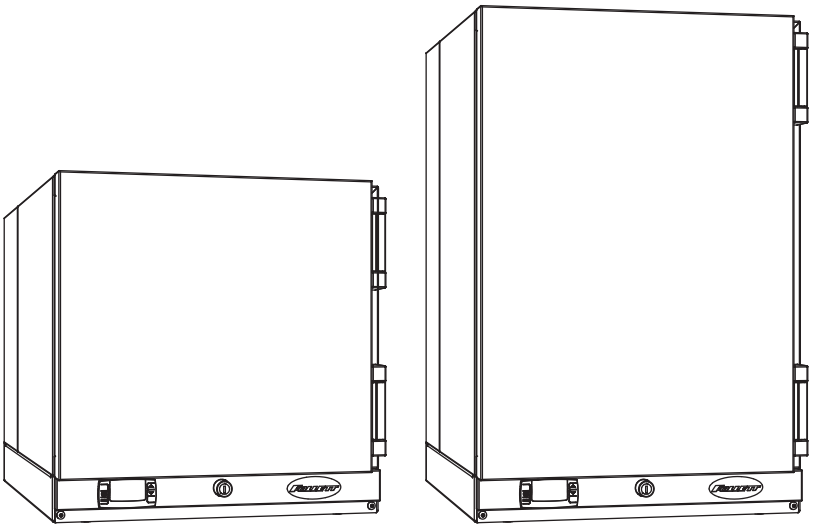
18688/18690
High-Performance Compact Refrigerators

Installation, Operation and Service Manual

English

Español

Français



18688 **18690**

Following installation, please forward this manual to the appropriate operations person.

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Specifications

Dimensions

	REF1	REF2
Dimensions (external)	18.6" W x 24" D x 17.75" H (47 cm x 61 cm x 45 cm)	18.6" W x 24" D x 27.75" H (47 cm x 61 cm x 70 cm)
Dimensions (internal)	14.5" W x 10" D x 11.25" H (37 cm x 25 cm x 29 cm)	14.50" W x 10" D x 21.25" H (37 cm x 25 cm x 54 cm)
Shelf Size	13.75 W x 9 D (35 cm x 23 cm)	13.75 W x 9 D (35 cm x 23 cm)
Capacity	1 cu ft (28 L)	1.8 cu ft (51 L)
Weight (uncrated)*	73 lbs (33 kg)	87 lbs (39 kg)

* Add 22 lbs/10 kg for packaging.

English

Ambient Information

CAUTION!

The REF1 and REF2 are for indoor use only.

	Optimum	Maximum
Air Temperature	≤80 F (28 C)	100 F (38 C)
Relative Humidity	60% max	

Clearances

- Dependent upon location. See *Locating the Refrigerator on page 5*.

Electrical

- 115V, 60 Hz, 1 phase, 1.8A, maximum fuse 15A
- Connect to dedicated 15A circuit, fuse or breaker. **Note:** It is preferred that circuit be protected by a GFCI.

Refrigeration

- Refrigerant R134a – 3.4 ounces (96 grams)

Heat Rejection

- 190 BTU/hr (56 W)

Installation

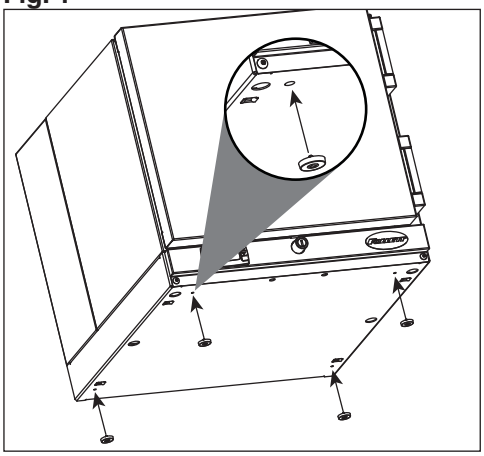
Installing Foot Pads - Required

CAUTION!

Use caution when tipping the refrigerator during foot pad installation. DO NOT EXCEED 30° angle. Tipping more than 30° can result in compressor malfunction.

1. Remove the foot pads (4) from the plastic bag packed inside the refrigerator.
2. Carefully tip the refrigerator back, ensuring that it can not fall, to expose the four foot pad holes **(Fig. 1)**.
3. Position the foot pad over the foot pad hole and press the *center* of the foot pad until it is fully seated. The foot pads extend 1/8" (3.2 mm) below the base of the refrigerator **(Fig. 1)**.

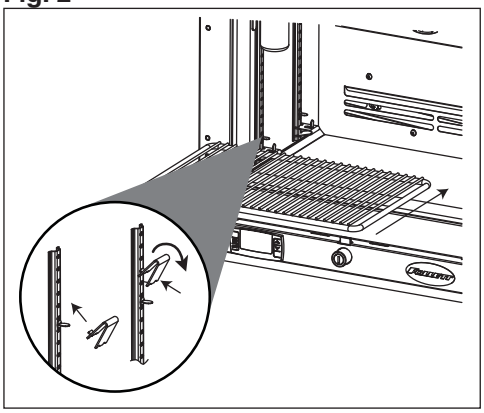
Fig. 1



Installing Shelves - Required

1. Remove shelves and shelf brackets packed inside refrigerator. (If ordered, find additional shelf accessory in separate box.)
2. Install shelf brackets in pilasters (insert top tab, squeeze and push in lower tab) **(Fig. 2)**.

Fig. 2



Installing Glycerine Solution in Product Simulation Bottle - Required

1. Remove the 60 ml bottle from the bracket located in the upper left corner of the refrigerator.
2. Remove the top and fill the bottle with a 50/50 solution of glycerine and water.
3. Replace the top (and probe).
4. Reinsert bottle into the bracket.

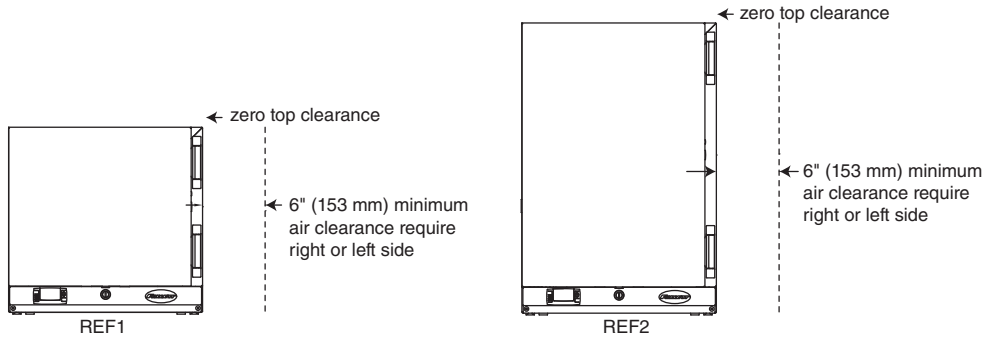
Note: The probe monitors product temperature and *must* be installed for proper display and alarming.

Locating the Refrigerator

Performance of REF1 and REF2 is affected by ambient temperature and location. To ensure proper performance, please refer to the following drawings and confirm that the clearance requirements are met. There is no clearance requirement for the back of the refrigerator so it can be placed against the wall.

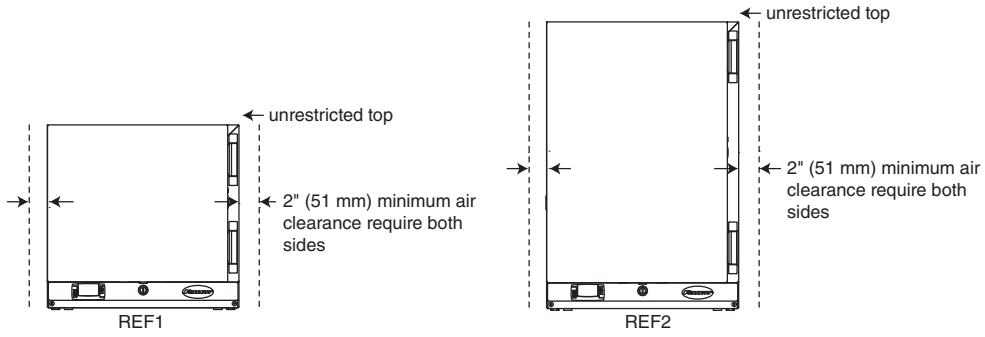
80 F (27 C) and 60% RH – located under overhanging cabinet or shelf with zero top clearance

Requires 6" clearance on either right or left side


zero top clearance
6" (153 mm) minimum air clearance require right or left side
REF1
zero top clearance
6" (153 mm) minimum air clearance require right or left side
REF2

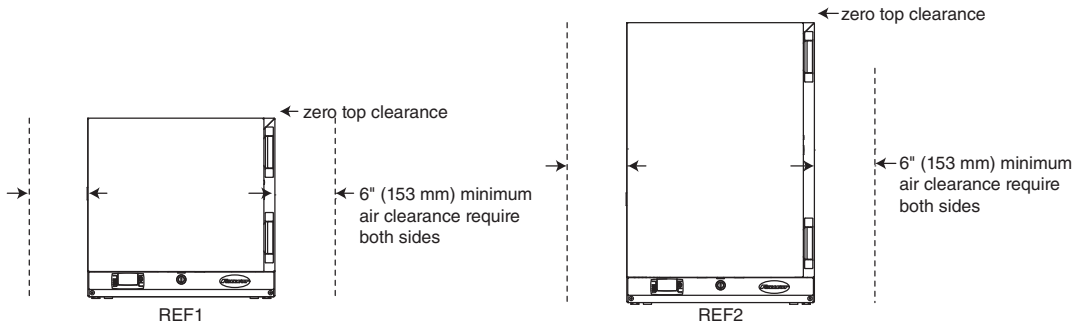
80 F (27 C) and 60% RH – unrestricted top clearance location

Requires 2" clearance on both sides and unrestricted top clearance


unrestricted top
2" (51 mm) minimum air clearance require both sides
REF1
unrestricted top
2" (51 mm) minimum air clearance require both sides
REF2

100 F (38 C) – maximum temperature location with zero top clearance

Requires 6" clearance on both sides


zero top clearance
6" (153 mm) minimum air clearance require both sides
REF1
zero top clearance
6" (153 mm) minimum air clearance require both sides
REF2

English

Reversing the Door Swing - Optional

CAUTION!

When reinstalling hinge screws, 242 blue Loctite MUST be applied to screws. Torque screws to 25 in-lbs.*

1. Use flat screwdriver to carefully remove hinge covers. Care should be taken to avoid scratching chrome cover or refrigerator body **(Fig. 3.1)**.
2. Support door and remove screws attaching hinge to refrigerator cabinet **(Fig. 3.2)**.
3. Remove plugs from opposite side of unit and cover hinge screw holes.
4. Remove screws holding lock strike-bracket at "bottom" inside of door **(Fig. 4.1).**
5. Remove plugs from inside of door "top" and install bracket.
6. Plug "bottom" holes with retained plugs and install lock strike-bracket to "top" inside of door **(Fig. 4.2)**.
7. Reverse door 180° so that lock strike-bracket is on the bottom inside of door **(Fig. 4.3)**.
8. Apply 242 blue Loctite* to hinge screws, reinstall screws (torqued to 25 in-lbs) **(Fig. 5.1)** and replace hinge covers **(Fig. 5.2)**.

Fig. 3

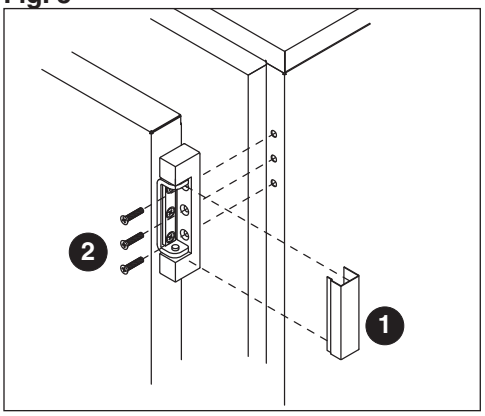
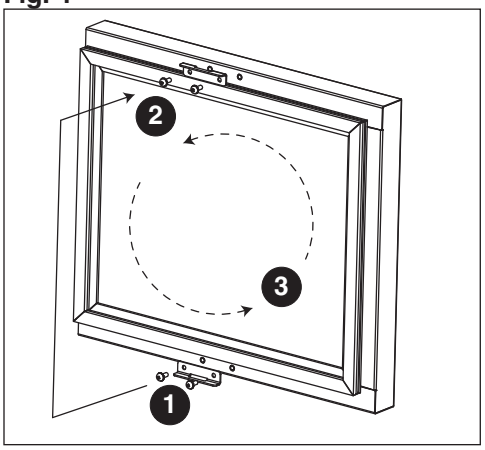
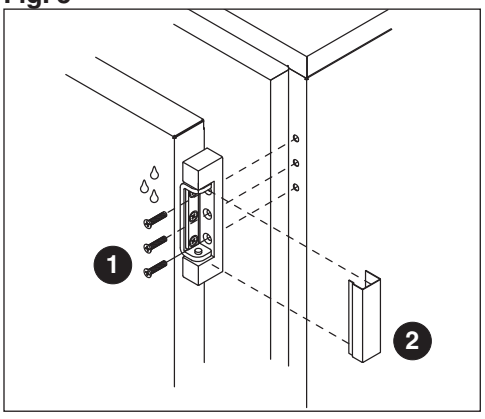


Fig. 4



*Loctite is a registered trademark of Henkel Corporation in the United States and other countries.

Fig. 5



Changing Temperature Display - Optional

NOTICE!

*It is important that you review the temperature/alarm settings after you change the temperature display. The controller contains two, separate temperature channels; F and C. Changes made to the factory default settings while displaying temperatures in F **will not** automatically transfer when you change the temperature display to C.*

Follett REF1 and REF2 refrigerators are factory-set to display temperatures in degrees F. To display the temperature in degrees C, follow these steps:

1. Move the power switch on lower rear panel to OFF and unplug the refrigerator.
2. Remove the front lower panel cover **(Fig. 6)** to access the controller.
3. Locate jumper wires for pins #9 and #11 **(Fig. 7)** and connect.
4. Reinstall the front lower panel cover.
5. Plug in the refrigerator and return the power switch to ON.

Fig. 6

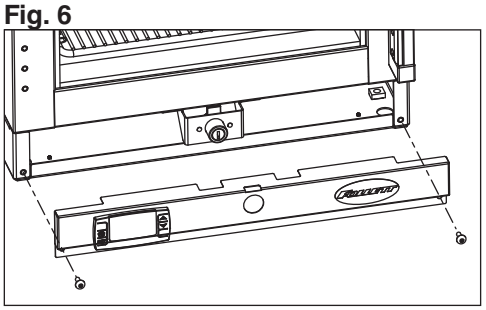
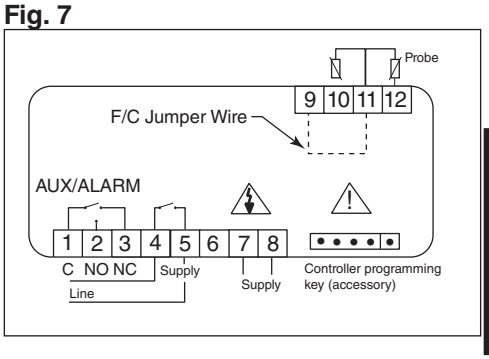


Fig. 7



English

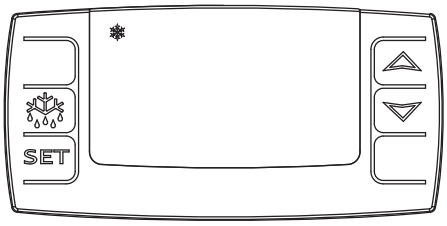
Alarming Functions

Follett's controller provides local high and low temperature alarming. If product temperature goes above or below the set temperature range, an audible alarm sounds and the display flashes. Alarming stops automatically as soon as soon as the temperature returns to normal values.

Most refrigerated medications should be stored between 36 F and 46 F (2 C and 8 C). The controller is factory-set to maintain product temperature at 39 F (4 C) and to display temperature in degrees F. If you want the temperature to display in degrees C, follow the instructions in *Changing Temperature Display - Optional* and make that change before setting your alarm values.

Note: The alarm function has no battery backup. If your refrigerator is not on a "red circuit" with generator backup, you may want to consider Follett's alarm module with battery backup (Item # 00112185) for maximum product security. Controller is factory-set with a high-alarm default setting of 100 F (38 C).

To set low temperature alarm value



1. Press SET and DOWN ARROW and hold for 3 seconds until HY appears.
2. Press DOWN ARROW until ALL appears.
3. Press SET to display current setting.
4. Press UP or DOWN ARROW to change to desired temperature.
5. Press SET to accept new value.
6. To set high temperature alarm value
7. Press SET and DOWN ARROW and hold for 3 seconds until HY appears.
8. Press DOWN ARROW until ALU appears.
9. Press SET to display current setting.
10. Press UP or DOWN ARROW to change to desired temperature.
11. Press SET to accept new value.

To mute the alarm

1. Press any key to mute the alarm.
2. The alarm will not sound until another alarm occurs.

To Change the Alarm Delay

The alarming feature is factory-set with a 1 minute delay to avoid nuisance alarming. Follow these steps to program the delay interval from 0 to 255 minutes.

1. Press SET and DOWN ARROW and hold for 3 seconds until HY appears.
2. Press DOWN ARROW until ALd appears
3. Press SET to display current delay setting.
4. Press UP or DOWN ARROW to change to desired delay interval.
5. Press SET to accept new value.

Disabling the Alarm

If local alarming is not desired, alarm set points can be changed to effectively disable all possible alarms. To disable alarm functions, follow the instructions in *Alarming Functions on page 7* for setting low and high temperature alarm values.

1. Set the low temperature alarm value for -40 F (-40 C).
2. Set the low temperature alarm value for 100 F (37.8).

Product will never reach these values, even in the event of refrigerator malfunction, and the alarm will not sound.

Maximum and Minimum Temperature Function

Follett's controller allows you to see the maximum and minimum product temperature experienced since last "reset". This feature does not provide any information on duration of the temperature values.

To see Minimum Temperature Recorded

1. Press and release DOWN arrow.
2. Lo message displays followed by minimum temperature recorded.
3. Press and hold SET for more than 3 seconds to reset.

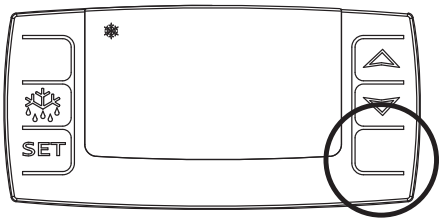
To See Maximum Temperature Recorded

1. Press and release UP arrow
2. Hi message displays followed by maximum temperature recorded.
3. Press and hold SET for more than 3 seconds to reset.

"Sleep" Function

You may not want the Follett temperature display when using a third-party temperature monitoring system with its own temperature display. You can put the Follett controller "to sleep" to avoid confusion. The compressor icon remains illuminated when the compressor is running.

1. Press BOTTOM RIGHT button to put display to sleep.
2. Press BOTTOM RIGHT button to return to display mode.



Operation

The temperature control board and P1 probe indicate when the refrigeration system is required to turn on and off.

The refrigeration system removes heat from the cabinet interior and rejects it to the surrounding room air. When the cabinet interior temperature reaches 4 F (2.2 C) above the controller set point, the probe signals the controller to turn the refrigeration system on. The normally open controller contacts close and energize the condenser fan motor and compressor. The evaporator fan runs continuously. The compressor uses a PTC device to turn on the compressor motor.

When the cabinet interior temperature falls to the set point, the probe signals the controller to turn the refrigeration system off. The controller contacts reopen, which de-energizes the evaporator, condenser fan motors and the compressor.

Automatic Defrost

REF Series refrigerators do not require manual defrosting. The unit defrosts automatically when the condensing unit is in the OFF cycle.

Any accumulated frost on the evaporator coil melts during the OFF cycle. The condensate drains to a plastic drain pan mounted below the condensing unit. The heat from the condensing unit evaporates any condensate in the drain pan.

English

Controller Operation

In normal operation, the controller displays temperatures in degrees F (default) or user-selected degrees C. F temperatures are displayed to the nearest degree, C temperatures are displayed to one decimal point. A snowflake LED displays when the compressor is running. The controller is pre-programmed with a 38 F (3.3 C) set point.

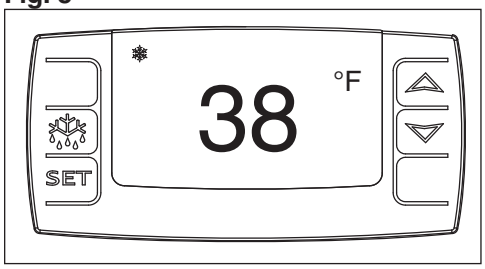
Follett presets its refrigeration system to hold medications at approximately 39 F (3.8 C).

If you are storing prepackaged food in this unit, NSF requires the set point be changed to 36 F (2.2 C) to maintain food below 40 F (4.4 C).

All set points have a 4 F (2.2 C) differential. This differential means that with a 38 F (3 C) set point, for example, the compressor will turn off at 38 F (3 C) and turn on when it reaches 42 F (6 C). This maintains product temperature for medications within the recommended range of 36 F to 46 F (2 C to 8 C).

Note: Display **(Fig. 8)** always reverts to P2 product temperature display after settings are accepted. It is important to note that P2 product temperature probe drives all alarming functions.

Fig. 8



To display temperature set point

1. Press and release SET and current cut-out temperature displays for approximately 5 seconds.
2. Display returns to current product temperature.

To change temperature set point

1. Press and hold SET for 3 seconds, until the current cut-out temperature displays and F or C flashes.
2. Press UP or DOWN arrows to set desired cut-out temperature.
3. Press and release SET and new cut-out temperature blinks three times.
4. Display returns to current product temperature.

Controller Security

The controller panel can be locked to prevent unauthorized programming changes. In locked mode, the controller displays cabinet temperature and set point only.

To lock the controller

1. Simultaneously press and hold UP and DOWN ARROW buttons for 3 seconds, until "PoF" displays (flashes 3 times).
2. Programmer is now locked.

To unlock the controller

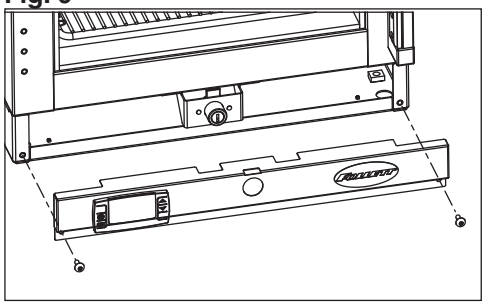
1. Simultaneously press and hold UP and DOWN ARROW buttons for 3 seconds, until "Pon" displays (flashes 3 times).
2. Programmer is now unlocked.

Programming Refrigerator from a Program Key (download)

1. Move the power switch on lower rear panel to OFF.
2. Remove the front lower panel cover to access the controller **(Fig. 9)**.
3. Insert appropriate programmed key into 5-pin receptacle located on back of controller.
4. Move the power switch to ON.
5. Values from key automatically download to refrigerator ("dol" message blinks followed by "end").
6. After 10 seconds, display returns to current refrigerator temperature and controller restarts with new values.
7. Move the power switch to OFF.
8. Remove programming key.
9. Reinstall panel.
10. Move the power switch to ON.

Note: An "Err" message displays for failed programming. Turn refrigerator OFF then ON to restart download, or remove key to abort.

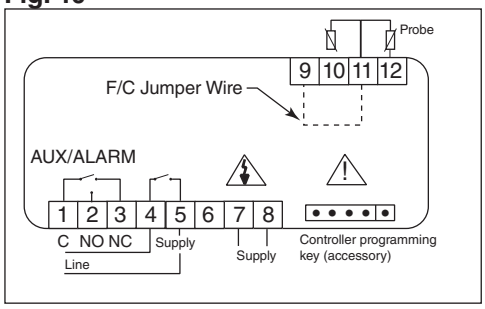
Fig. 9



Connecting to Dry Contacts for Remote Alarming

1. Move the power switch on lower rear panel to OFF and unplug the refrigerator.
2. Remove the front lower panel cover **(Fig. 9)** to access the controller.
3. Connect two wires from the remote alarm device to contacts 1(C) and 2(NO or NC) on the temperature controller **(Fig. 10)**.
4. Carefully route wires through the back of the refrigerator; do not to run wires over surfaces that may damage the wiring.
5. Reinstall the front lower panel cover.
6. Connect remote alarm device.
7. Plug in the refrigerator and return the power switch to ON.

Fig. 10



Installing Third-party Temperature Probe

Facilities using a third-party alarming and/or temperature monitoring system need to install the third-party probe in the refrigerator. Follett recommends removing any stored product before performing this procedure.

Refer to for instruction to disable Follett integral alarming to eliminate confusion between two monitoring services.

1. Move the power switch on lower rear panel to OFF and unplug the refrigerator.
2. Remove the rear panel of the refrigerator **(Fig. 11)**.
3. Open front door of refrigerator and remove shelf/shelves, if installed, for better access.
4. From inside the refrigerator, push and fold the perforated cut out located on the inside, upper-right hand corner **(Fig. 12)**.
5. Use a long screwdriver or drill to create a hole (up to 1" (25.4 mm) diameter) through the exposed foam insulation.
6. From inside the refrigerator, feed non-probe end of wire through opening **(Fig. 13)**.
7. Secure probe to interior cabinet wall to avoid product interference.
8. Gently pull on non-probe end of wire to remove slack from inside of refrigerator.
9. Use Permagum* or equivalent sealant to replace foam insulation (removed in Step 5) to ensure proper performance of refrigerator.
10. Remove any debris that may have fallen into the drain pan or condensor area.
11. Route non-probe end of wire through appropriate ventilation hole in refrigerator rear panel.
12. Reinstall the rear panel.
13. Connect non-probe end of wiring to monitoring device.
14. Plug in the refrigerator and return the power switch to ON.
15. Follow instructions found in *Disabling the Alarm on page 8* to disable alarm functions.

* Permagum is a registered trademark of the Presstite Engineering Company.

Fig. 11

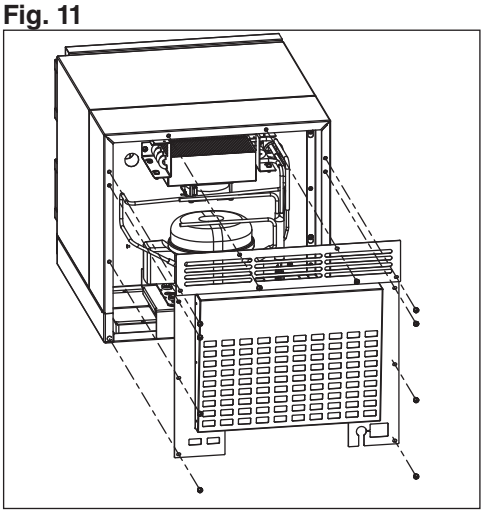


Fig. 12

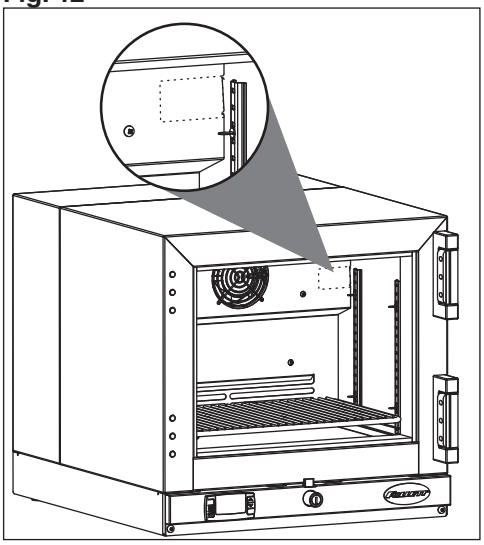
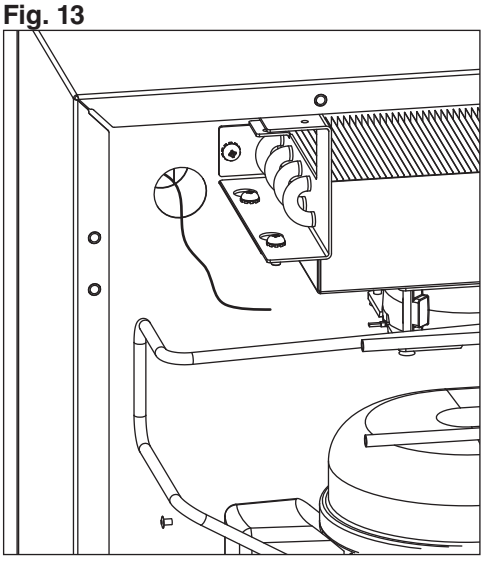


Fig. 13



English

Cleaning

CAUTION!

Use only non-chlorine-based cleaners. Use of cleaners containing chlorine can cause staining and pitting of the stainless steel

Interior

Using a sponge or soft cloth, clean unit with a non-abrasive, non-chlorinated, all-purpose detergent.

Exterior

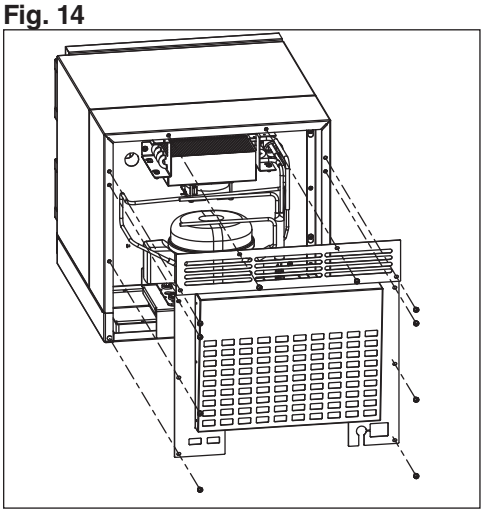
Wipe exterior with a soft cloth in the direction of grain as needed. Stainless steel polish may be used to enhance the finish of the unit.

Annual Cleaning

Removal of dust and other particulates from air intake areas and the condenser is important for proper operation. Under certain conditions, some environments with large amounts of dust may require more frequent cleaning.

1. Move the power switch on lower rear panel to OFF and unplug the refrigerator.
2. Remove rear panel **(Fig. 14)**.
3. Remove drain pan.
4. Clean drain pan with a non-abrasive, non-chlorinated all-purpose detergent.
5. Reinstall drain pan.
6. Use a vacuum cleaner with brush attachment to clean condenser, compressor motor, and related parts.
7. Reinstall rear panel.

Fig. 14

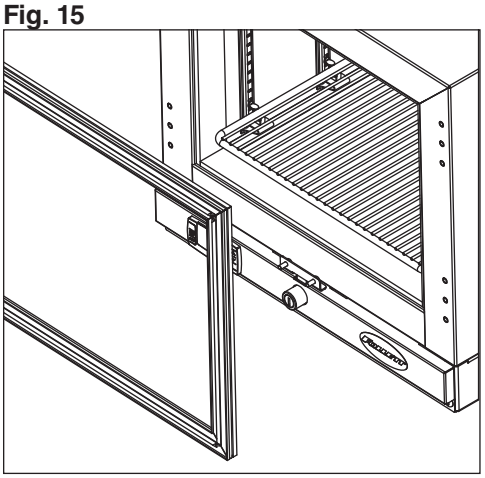


Service

Door Gasket Replacement

1. Remove existing gasket from mounting track (Fig. 15).
2. Verify mounting track is free of any remaining gasket material.
3. Align new gasket with mounting track and press firmly in place.
4. Open and close door, checking for proper gasket seal without pinching against refrigerator.

Fig. 15



Access Compressor Compartment

Follett's compressor compartment allows technicians to gain full access to the condensing unit from the refrigerator back without cutting refrigerant lines.

1. Remove rear panel **(Fig. 16)**.
2. Remove two screws facing downward that secure the panel assembly to the base plate.
3. Loosen the six screws that secure the rear panel to the back of the refrigeration box. Lift rear panel off to access **(Fig. 17)**.

Fig. 16

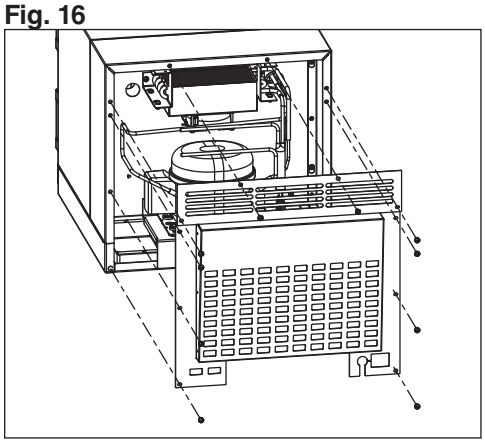
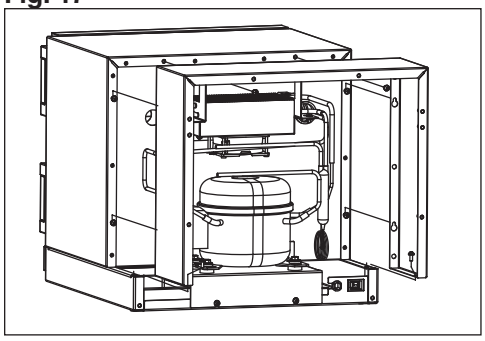


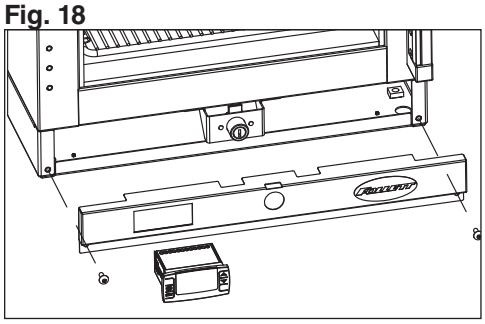
Fig. 17



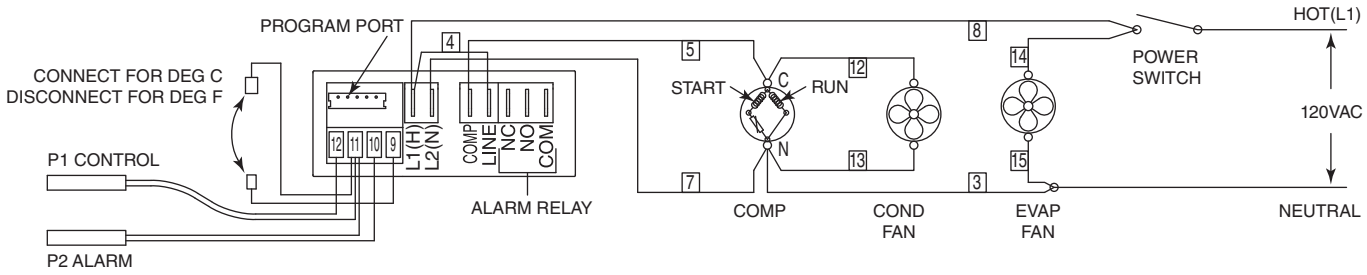
Controller Replacement

1. Disconnect power to unit by moving switch on lower rear panel to the OFF position, and removing power cord from wall outlet.
2. Remove 2 screws from front panel to access back of controller **(Fig. 18)**.
3. Disconnect wiring from controller back. (Note wire locations.)
4. Push in at center of controller side brackets to release and slide brackets back and off of controller.
5. Push controller out through front of front panel.
6. Slide brackets onto sides of controller and push against back of panel.
7. Reconnect wiring to controller in same location noted in Step 3.
8. Replace front panel, restore power and test operation. Re-program replacement controller if necessary using program key ordered with controller replacement kit.

Fig. 18



Wiring Diagram

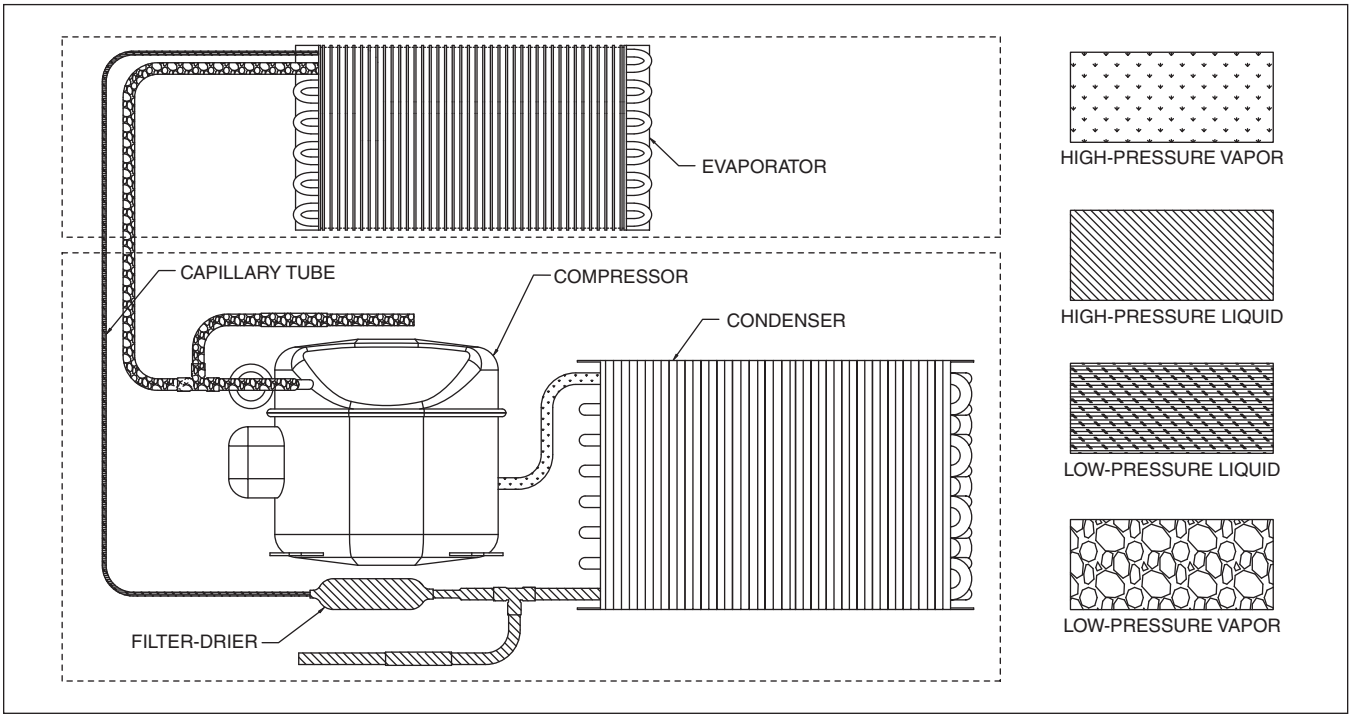


Refrigeration System

The REF Series refrigeration system is designed to give many years of trouble-free service. Except for routine cleaning of the air-cooled condenser and related parts, the refrigeration system requires no service or maintenance. The system uses a capillary tube and is critically charged. All refrigerator components are easily accessed from the rear of the unit.

Please contact Follett Service Department in the event of a refrigeration problem that requires evacuation and recharging.

Refrigeration System Diagram



Refrigerator Troubleshooting

Before calling for service

1. Check that unit is plugged in.
2. Test outlet with another appliance to verify power.

Troubleshooting Matrix

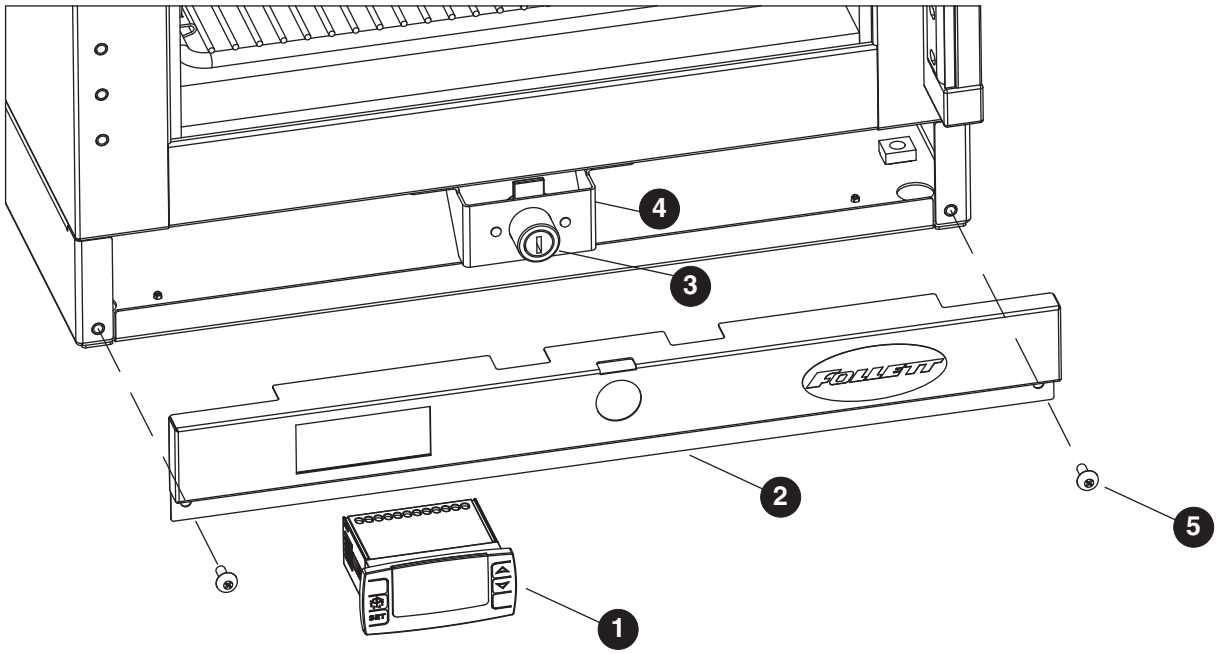
Sympton	Possible Cause	Solution
Refrigerator does not operate (no components run).	Power switch faulty or in OFF position; loose connection.	Turn power switch to ON; check switch and connections.
	Refrigerator not plugged in.	Connect plug.
	No power to cord.	Restore power.
	Temp controller not energizing components.	Check controller contact terminals for power. Replace controller if needed.
	Probe not sensing set point temperature.	Replace controller and/or probe.
Compressor does not run.	Thermal overload open or defective.	Allow to cool or replace.
	Capacitor and/or relay defective.	Replace as required.
	Compressor defective.	Replace compressor.
Evaporator fan motor does not run.	Defective fan motor.	Replace fan motor.
Refrigerator does not shut off.	Controller not sensing cut-off temperature.	Replace controller and/or probe.
	Controller keeping refrigeration system energized.	Replace controller.
Refrigerator does not maintain temperature (all components run).	Condensor or evaporator coil needs cleaning.	Clean coils.
	Faulty door gasket.	Replace door gasket.
	Excessively high ambient or indadequate air clearance.	Maximum recommended ambient is 100 F (38 F). See *Locating the Refrigerator on page 5*.
	Refrigerant leak.	Locate and repair leak.
	Incorrect refrigerant charge.	Recover, evaluate and weigh in correct charge.
	Plugged capillary tube.	Replace capillary tube and filter drier.
	Inefficient compressor.	Consult technical services.

If problems persist after following this basic troubleshooting guide, call Follett technical service group at (877) 612-5086 or +1 (610) 252-7301.

English

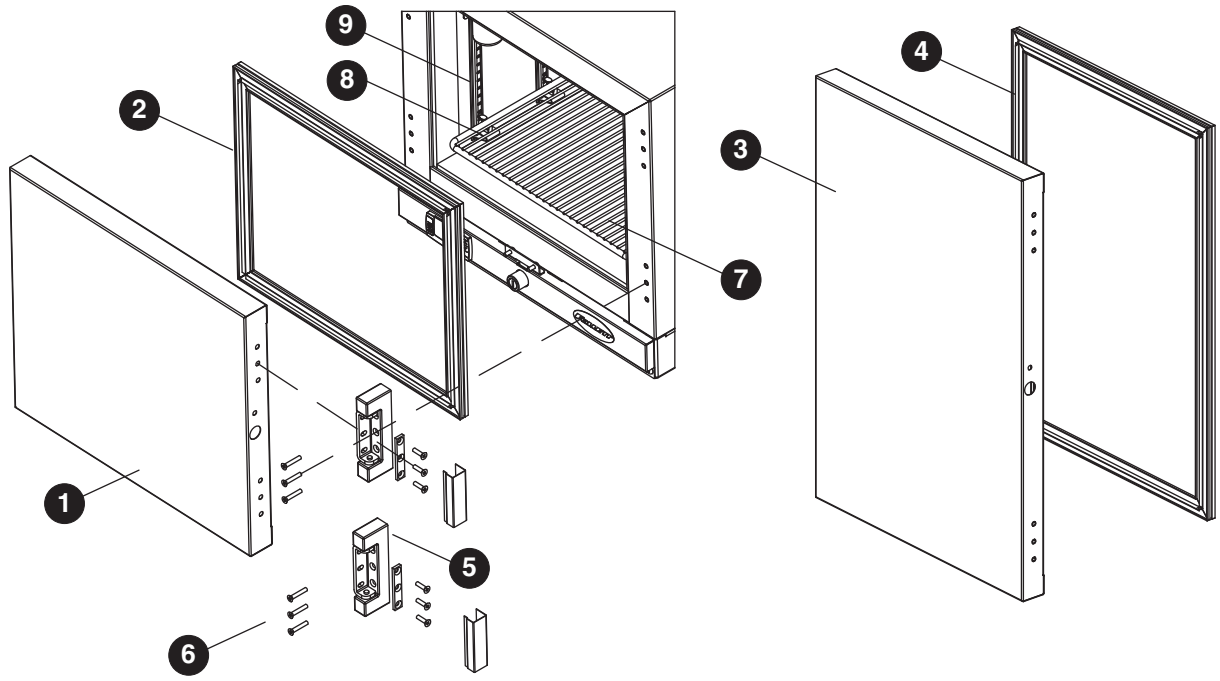
Replacement Parts

Exterior Components



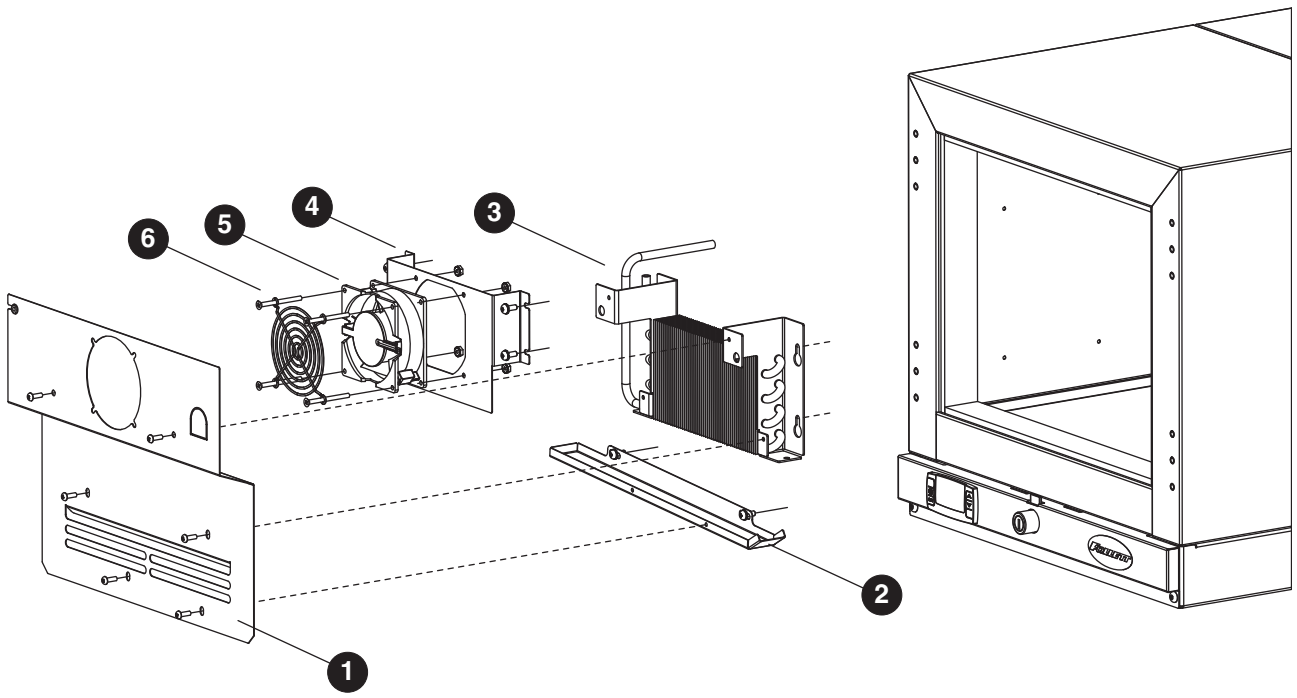
Reference	Description	Part #
1	Temperature Controller (must also order program key)	00959494
2	Panel, Front	00953208
3	Lock, Deadbolt (includes keys)	00959528
4	Bracket, Lock Mounting	00940619
5	Screw, Phil Truss HD, 10-32 x 1/2"	00105379
Not shown	Program key, factory default settings	00967596
Not shown	Foot pads	00900134

Door and Gasket Components



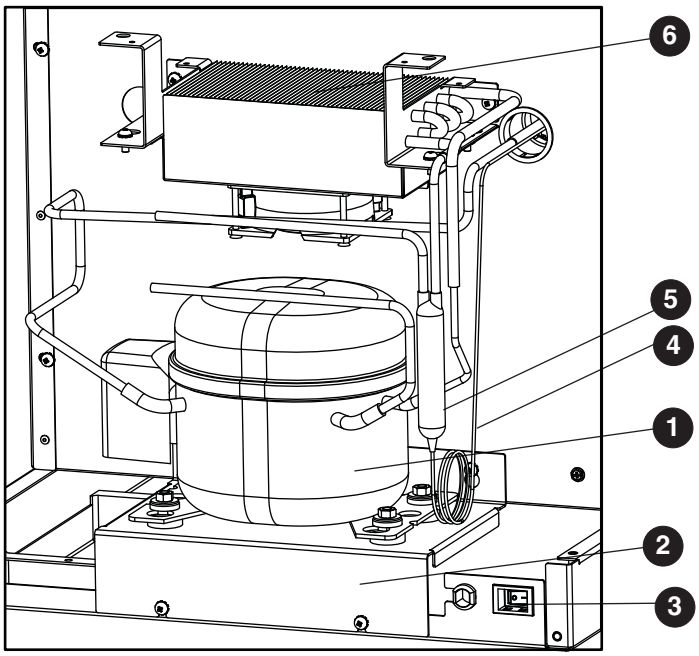
Reference	Description	Part #
1	Door, Assy, REF 1	00953182
2	Gasket/REF 1	00960823
3	Door, Assy, REF 2	00953174
4	Door Gasket / REF 2	00960831
5	Hinge, REF 1 and REF 2	00940478
6	Screw, Hinge - Pkg 6	00953190
7	Shelf	00960872
8	Support, Shelf, Snap fitting	00156240
9	Support, Shelf, Pilaster	00105346
Not shown	Lock Strike Bracket	00945790
Not shown	Bottle, 60 ml	00112037
Not shown	Gasket, REF, Alarm Bottle	00112029
Not shown	Bottle, Bracket, REF	00961656
Not shown	Glycerin	00959296

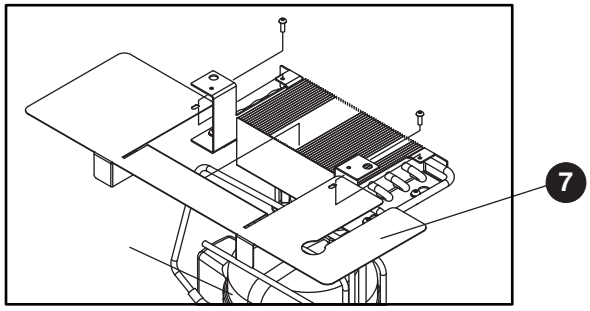
Evaporator and Motor

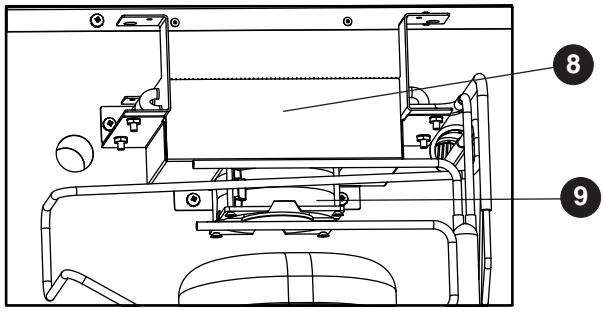


Reference	Description	Part #
1	Cover, Evaporator, REF 1	00958728
Not shown	Cover, Evaporator, REF 2	00958975
2	Drain Pan, Evaporator, REF 1 and REF 2	00961037
3	Coil, Evaporator/Condenser, REF 1 and REF 2	00939835
4	Shroud, Evap Fan, REF 1 and REF 2	00958736
5	Motor, Fan	00940460
6	Guard, Fan	00940452
Not shown	Probe, (note REF1 and REF2 use two probes each)	00155697
Not shown	Bracket, Probe Guard	00980854

Compressor Components







Reference	Description	Part #
1	Compressor, REF 1 and REF 2	00959502
2	Bracket, Compressor Support, REF 1 and REF 2	00958694
3	Switch, Rocker, Recessed	00967604
4	Capillary Tube, REF 1 and REF 2	00959510
5	Filter/Drier	00961631
6	Coil, Evaporator/Condenser, REF 1 and REF 2	00939835
7	Baffle, Air	00965814
8	Shroud, Condenser Fan, REF 1 and REF 2	00958744
9	Motor, Fan	00940460
Not shown	Cord, Power, NEMA 5-15 Hospital Grade	00961268